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proving the daring of the jay in dealing with the most audacious of the bird-destroying hawks; second, in showing the assistance which an expert hawk, or a pair of hawks hunting together, must gain from the inclination of the jays and woodpeckers to hector them instead of seeking safety in retreat. The advantage which the owl enjoys in drawing other birds around him is well known, but it is not often that so good an illustration is given in the case of the hawk.

Chocorua, N.H., Aug. 20.

FRANK BOLLES.

Tornado-Whirls in the Upper Clouds.

THIS morning I witnessed what seemed to me a very interesting and unusual phenomenon, which may be worthy of record. I noticed that a number of light flock clouds, moving north-east in the upper atmosphere, became, on reaching a certain small well-defined area, very ragged, and assumed the characteristic tornado forms. Many looked like jagged craters, reminding me strongly of the photographs of sun-spot whirls; some were honey-combed, and all were greatly torn. In the course of some ten minutes' observation, I saw at least a dozen such tornado-centres in cirro-cumulus, detached clouds floating almost directly above me. Such appearances in the lower clouds I have often observed, but this is the first time I remember seeing the upper clouds disturbed in this manner. The wind at the time on the surface of the earth was a forty-mile gale from the south-west, and there were frequent dust-whirls.

HIRAM M. STANLEY.

Marquette, Mich., Aug. 18.

The Brutal Dove.

TWENTY-ONE years ago (Aug. 14, 1871), a mature, male dove flew into the house of Mr. Paul Closius of Chicago, and soon became quite domesticated. "Old Tom," as he is called, was rescued from the great fire of the following October, and later was given a female mate, which he pecked to death.

Thinking that it might be an instance of incompatibility, he was given another, which he tormented, neglected, and abused, until she also perished.

Naturalists are aware of the sentimental error which typifies gentleness in the dove, and have often remarked its ferocity. This instance also confirms the belief that doves are long-lived.

S. V. CLEVINGER.

Chicago, Aug. 17.

BOOK-REVIEWS.

Temperament, Disease, and Health. By FRENCH ENSOR CHADWICK. New York, G. P. Putnam's Sons. 85 p.

A REAL service is rendered science by those who emphasize the individual as well as environmental side of pathology. The tremendous development along certain lines of modern pathology should not be allowed to obscure the fact that predisposition of the organism is as potent a "cause" of disease as virulence of the germ.

The author of this book avows himself a special pleader on the very first page: "This little book is written primarily to put forward two ideas: First, that there is associated with temperament a specific rate of change; second, that the failure to keep up that rate, or, in other words, a failure to have elimination keep pace with accession of material, is the primal cause of organic disease." This thesis is maintained quite consistently throughout the book. "I thus venture to define what is known as 'organic disease' as a failure in rate of change. And, further, that, however associated, bacteria are the resultant rather than the causes of such diseases" (p. 16).

It will not be perfectly obvious to everyone that the phrase "failure in rate of change" brings us much nearer the real problem. The vexatious question will still be asked, Why should there be this failure to obtain adequate elimination of broken-down material? The final solution of this question of temperament must wait for a much deeper knowledge of the individual cell as well as of the cell-complex. Every attempt, however, at an explanation, although necessarily tentative and imperfect in character, serves its purpose in keeping the subject open and in stimulating research.

Errors of statement do not seem to be numerous. One strongly suspects, however, that the Mitchell mentioned on page 33 is no

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